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REMARKS

The application has been reviewed in light of the final Office Action dated January 27, 2006. Claims 1-3 and 5-10 are pending. Claim 4 was previously canceled, without prejudice or disclaimer. By this Amendment, claims 1, 5-7 and 10 have been amended to clarify the claimed invention. Accordingly, claims 1-3 and 5-10 are presented for reconsideration, with claims 1 and 6 being independent form.

Claim 6 was objected to under 37 C.F.R. §1.75(c) as purportedly in improper dependent form for failing to further limit the subject matter of a previous claim.

By this Amendment, claims 1 and 6 have been amended to clarify the claimed invention.

Withdrawal of the objection under 37 C.F.R. §1.75(c) is respectfully requested.

Claims 1, 2, 5-7, 9 and 10 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent Publication No. 2002/0145426 A1 (Minas et al.) in view of U.S. Patent No. 5,517,121 to Kaufman et al. Claim 3 was rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Minas in view of Kaufman, and further in view of U.S. Patent No. 5,436,607 to Chari et al. Claim 8 was rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Minas in view of Kaufman, and further in view of U.S. Patent No. 6,828,792 to Danby et al.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 1 and 6 are patentable over the cited art, for at least the following reasons.

This application relates to magnetic resonance imaging (MRI) equipment of a vertical magnetic field type. Conventional equipment of such type generally includes (i) a gantry which has a pair of magnets for forming a static magnetic field which are arranged above and below, respectively, a measurement space into which an object to be examined is inserted, (ii) columns supporting the upper magnet, and (iii) a bed on which the object to be examined is placed. MRI

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equipment of such a configuration is typically used when access to the object being examined is required, such as in interventional MR. However, MRI equipment configured in such a manner may not allow easy access from multiple directions.

Applicant devised improvements to such a MRI apparatus to make it easy for access to the object to be examined from various directions, as illustrated in Figs. 4 and 6. For example, in the improved apparatus, the bed base is movable along the periphery of the gantry and is disposed at the side of one of the columns with respect to a line perpendicular to both (i) a line connecting the centers of the pair of columns and (ii) a line passing through the center of the pair of magnets, and the top plate is moved along the longitudinal and the transverse directions of the bed base. Each of independent claims 1 and 6 addresses these features, as well as additional features.

Minas, as understood by Applicant, is directed to an open MRI apparatus having axially-spaced pairs of magnet coils supported by a pair of diametrically opposed supports. Specifically, Minas proposes such an apparatus having supports 16 and 18 which are hollow cylindrical pipes, disposed diametrically opposed to one another on opposite sides of the magnet half sections 12 and 14 in order that liquid helium is channeled from the upper magnet half section 12 to the lower magnet half section 14.

However, Applicant does not find teaching or suggestion in Minas of an MRI apparatus having the configuration of a bed base and top plate relative to magnets recited in the pending claims of this application.

In addition, Applicant does not find in Minas a teaching of a magnetic resonance imaging apparatus wherein the bed base is movable along the periphery of the gantry and is disposed in the side of one of the columns with respect to a line perpendicular to both (a) a line connecting the centers of the pair of columns and (ii) a line passing through the center of the pair of magnets, and the top plate is moved along the longitudinal and the transverse direction of the bed base.

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Kaufman proposes an MRI system with side access to an image volume, wherein two magnet poles are connected and physically supported by a pair of magnetically permeable columns to form a magnetic circuit. Kaufman proposes that the symmetry axis of the magnet be rotated to be non-perpendicular with respect to the longitudinal axis of the patient support transport. See demonstrative Figure A attached as **Exhibit 1** hereto.

Assume for the sake of an argument that Kaufman and Minas are combined such that the two support pipes 16 and 18 of Minas are combined with the magnetic circuit (including the two magnet poles) of Kaufman, and each of the column parts has both a magnetically permeable column to form the magnetic circuit and a support pipe disposed at the imaging volume side of the magnetically permeable column to channel liquid helium between two magnet poles (see demonstrative Figure B in **Exhibit 1** attached hereto). As a result, the cross section of each column part becomes too large to allow open and unobstructed access to the imaging volume, and a rotation range of the top plate becomes much smaller than the case of having only a pair of columns (see demonstrative Figure C in **Exhibit 1** attached hereto). However, Applicant submits that there is no suggestion in the art to combine Kaufman and Minas and that the combination thereof would not have been obvious at the relevant time.

In contrast, in the claimed invention of the present application, a cross-sectional area of one column of the pair of columns is made smaller than that of the other, to increase accessibility to a patient more than the combination of Minas and Kaufman which has a pair of columns, each with a large cross-sectional area.

In addition, Kaufman does not teach or suggest that a patient transport mechanism (bed or plate) 48 is moved along the longitudinal and the transverse direction of a bed base. Kaufman teaches that the patient transport mechanism is rotated and the symmetry axis 44 of the magnetic circuit is rotated with respect to the longitudinal axis 46 of the patient transport mechanism. This

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means that an MRI of Kaufman can take images of the patient only around a rotating axes, which is the vertical central axes of the poles 60.

In contrast, claim 1 provides that the top plate is moved along the longitudinal and the transverse direction of the bed base, and the MRI apparatus of claim 1 can take images of the patient at not only one position but also other positions.

In short, even the combination of Minas and Kaufman does not teach or suggest a magnetic resonance imaging apparatus, wherein a cross sectional area of one column of the pair of columns is made smaller than that of the other, and wherein the bed base is movable along the periphery of the gantry and is disposed at the side of one of the columns with respect to a line perpendicular to both (i) a line connecting the centers of the pair of columns and (ii) a line passing through the center of the pair of magnets, and the top plate is moved along the longitudinal and the transverse direction of the bed base, as addressed in claims 1 and 6 submitted herewith.

Chari and Danby were cited against dependent claims of this application only.

Chari, as understood by Applicant, is directed to an open magnet having two magnet assemblies arranged in a spaced apart, parallel relationship to define a working space therebetween for magnetic resonance imaging. The magnet assemblies are attached to a C-shaped support frame which is rotatively mounted to a pedestal member. Chari was cited in the Office Action as purportedly proposing an open MRI magnet in which the support is bulged outward in the center.

Danby, as understood by Applicant, is directed to MRI equipment which includes a patient support device that is operable to accept a patient who enters the patient receiving space in an upright position. Danby was cited in the Office Action as purportedly proposing support columns with a rectangular cross-section.

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Applicant does not find disclosure or suggestion in the cited art, however, of a magnetic resonance imaging apparatus wherein a cross sectional area of one column of the pair of columns is made smaller than that of the other, and wherein the bed base is movable along the periphery of the gantry and is disposed at the side of one of the columns with respect to both (i) a line perpendicular to a line connecting the centers of the pair of columns and (ii) a line passing through the center of the pair of magnets, and the top plate is moved along the longitudinal and the transverse direction thereof.


Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claims 1 and 6, and the claims depending therefrom, are patentable over the cited art.

In view of the amendments to the claims and remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Office is hereby authorized to charge any fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,

  
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